Bio-investigations into the Gum Cultivation Cycle in Central Sudan

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ABSTRACT

Field studies were conducted for three years at three states in central Sudan: North Kordofan (2004-2006), South Darfur (2001-2004) and Sennar (2006-2008). The aims were to tree/crop relations within the gum cultivation cycle on sandy soils, the effect of *Acacia senegal* plantations on "Gardod" soil and to compare the effect of intercropping of groundnut, sesame and sorghum within the *A. senegal* gum gardens with sole cropping of the same crops on yield, respectively. In the first study, the results showed that all treatments gave land equivalent ratio (LER) of more than one indicating the superiority of growing field crops in intercropping with *Acacia senegal* over sole cropping system. The economic analysis revealed that all treatments were economically attractive since they gave positive net revenue. The second study revealed that soil moisture was higher under trees than in the open. Yield of gum Arabic was higher in the 4×8 meter spacing than in the 4× 4 m and 8×8 m spacing and the control. In the last study, the results indicated increased crop yields under intercropping – probably due to increased fertility and shelter under *A. senegal* trees. Although gum Arabic decreased in intercropped plots, yet the land equivalent ratio was positive due to the high crop yields relative to sole cropping. Furthermore, crop yields were much higher than the yields in traditional fields.

Key words: Intercropping; gum gardens; cultivation; land equivalent ratio